REMARKS

Each of independent claims 1, 13, 17, 21, 24, 29, and 33 has been amended and now recites a "concept landscape visualization".

As acknowledged by the Examiner on page 3 of the office action, the primary reference Hendrickson describes a "geometric space" map ("In other words, Hendrickson teaches locating related words in geometric space for data mining"). Also, as noted by the Examiner, Hendrickson fails to disclose generating a second surface map.

In the Background section of Applicant's specification, "geometric space representations" are distinguished from a landscape view of the themes or content of a document set:

> "The landscape view of the themes or content of a document set is distinct from other types of visualizations that provide visual overviews of the relation of one document to another. These methods include self-organizing maps (Kohonen, *Self-organization and associative memory*, 3rd edition, Berlin, Springer-Verlag), hierarchical taxonomy-based visualizations (U.S. Patent 5,625,767 to Bartell and Clarks), **geometric space representations (U.S. Patent 5,930,784 to Hendrickson**; U.S. Patent 5,987,470 to Meyers et al.; U.S. Patent 5,794,178 to Caid and Carleton). However, these alternative types of visualizations can serve as the two-dimensional framework on which the landscape visualization can be built." (emphasis added)

The primary reference, Hendrickson, was specifically referred to in Applicant's specification as an example of the "geometric space representation" which is distinguishable from a landscape visualization. The specification further states that, at most, the geometric space representation can serve as a two-dimensional framework on which a landscape visualization can be built.

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In contrast, various aspects of Applicant's claimed invention for generating a concept landscape visualization are described in the embodiments set forth in Applicant's specification. For example, as illustrated in Fig. 2, a concept landscape visualization module 264 is provided, along with a two-dimensional proximity map module 262. As described beginning on page 9 of the specification, the module 262 first creates a list of features for generating a signature for each data record and then creates a representation of those records in the form of a two-dimensional map or grid (page 9, lines 17-19). Fig. 3 is an example of such a two-dimensional proximity map (galaxy view 302) (see pages 10-11). Then, the module 264 is used to generate a concept landscape map for the data records (page 9, line 23 to page 10, line 1); see for example, the concept landscape visualization 402, shown in Fig. 4.

In one of Applicants' embodiments for generating a concept landscape visualization, theme terms, which are words or phrases chosen by the user (via a user interface or by default), are used to calculate the concept landscape surface height at each point on its grid. For example, a predefined number of terms or phrases with the highest topicality in the data set's vocabulary may be used as theme terms, where topicality indicates the ability of a particular word to express the content of a document and differentiate it from other documents in this set (page 12, lines 3-9). Methods that use other features for generating the concept landscape visualization are also described in the specification (page 12).

With reference to Fig. 5, a user may choose from one or more algorithms or methods for creating the concept landscape (see page 13, beginning at line 15). This is an example of the method recited in claim 1 in which a user can select from first and

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second generation methods for generating a concept landscape visualization. Further, this ability to generate different landscape visualizations, enables the user to switch between first and second visualizations to determine the influence of the first and second generation methods on the data records (see claim 10). Also, by adjusting the features (text words, phrases or other attributes) used for the theme terms, an alternative view of the terms in the data set can be provided. This allows the user flexibility in the origin of the theme terms, which for example enables the user to select different theme terms for use in a subsequent re-computation of the concept landscape (page 16, lines 1-13). As an example, Fig. 8 shows a user interface which enables a user to replace one or more attributes or theme terms associated with a set of data records associated with a user-defined term (e.g., synonym) for use in re-computing the theme map that defines the concept landscape (see page 16, lines 14-18 and independent claims 21, 24 and 29).

Still further, Fig. 9 illustrates a method of associating labels with selected peaks of the concept landscape visualization (see the specification at page 18 and claim 17). Still further, Fig. 10 is an example of a landscape overlay screen 1000 in which a two-dimensional galaxy map may be superimposed over the landscape map, with the points representing the two-dimensional map highlighted on corresponding points in the landscape view (see page 20 of the specification and claim 13). Superimposing a visualization of the underlying two-dimensional information space over the landscape view can be used to provide context between the two visualization types (page 20, lines 11-13).

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Still further, Fig. 11 illustrates an example of a display screen 1100 in which a chart 1102 is created that shows a visualization of all theme terms associated with a selected region 1108 (see page 20 and claim 33). Thus, the user may be given access to a more complete distribution of terms associated with a specific region of the concept landscape visualization.

In summary, Applicant describes and claims new methods and apparatus for generating and enabling interaction with concept landscape visualizations.

In contrast, the primary reference Hendrickson does not teach or suggest any concept landscape visualization but rather is directed to formation of a geometric space representation. Thus, the primary reference fails to teach or suggest generating any concept landscape visualization, much less plural landscape visualizations or Applicant's claimed methods and apparatus for interacting with such visualizations. At most, Hendrickson's geometric space representation can serve as a two-dimensional framework on which a landscape visualization can be built.

Nor does the secondary reference, Becker, cure the deficiencies of the primary reference. As acknowledged by the Examiner, Becker describes a method and system for visually approximating a scatter plot by an interpolation process which is performed over pre-processed bins of scattered data points, and in which an interpolated dependent attribute can be mapped to color in a visualized scatter plot. The plot appears as rendered splats corresponding to bin positions of interpolated bins, where each splat has an opacity that is a function of the interpolated weight of data points in the corresponding bin (Abstract).

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As described more fully in column 4, Becker's "splat", also called a footprint, is a transparent shape used to build a transparent volume. Splats, as used in Becker, includes a Gaussian splat that is most opaque at its center and approaches zero opacity according to a Gaussian function in every radial direction. A Gaussian splat is typically approximated with a collection of Gourard shaded triangles, or as a texture mapped polygon (e.g., rectangle) (see Becker, column 4, lines 34-59).

In Becker, Fig. 1 shows a routine 100 for visually approximating scattered data (column 5, lines 29-30). Each data record has four attributes (longitude, latitude, depth and value) characterizing each ore sample (column 5, lines 54-55). A binning resolution creates uniform bins for each data attribute that is mapped to a scatter axis (column 5, line 53 to column 6, line 6). A sum of the weight of scattered data points aggregated in each bin is determined, and the aggregate value in one example is an average value of a data attribute of scattered data points in a bin (column 6, lines 31-36). Then, for cell projection, cubes are constructed by using bin centers as vertices. The opacity assigned to the vertices is then a function of the weight of scattered data points in a corresponding bin (column 9, lines 1-6).

Next, splats representative of the bins are rendered using a computer. A splat is drawn at each bin location to form an image that visually approximates an original scatter plot of the data (column 7, lines 24-30). For example, Fig. 7a shows a Gaussian texture 700 that can be texture mapped by a graphics engine to form a textured splat. Fig. 7b is a graph of the opacity of Gaussian texture 700 illustrating the variation and opacity from a peak at the center to zero according to a Gaussian function (column 4, lines 60-64).

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In summary, Beckers' scatter plot visualization has little if any relevance to Applicant's claimed concept landscape visualization, or Hendrickson's geometric space map. There is no suggestion for combining Becker with Hendrickson, and even if combined, the combination fails to teach or suggest the subject matter of Applicant's claims. Thus, Applicant respectfully asserts that the present claims patentably distinguish over the cited references, taken singly or in combination.

Minor amendments have been made to the dependent claims for consistency and are fully supported by the specification as described above.

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims. This amendment is made without prejudice to the filing of a continuation application with unamended or additional claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: Sept 26, 2003

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Vernon L. Crow et al.	)	Group Art Unit: 2671
	)	
Serial No.: 09/675,515	)	Examiner: Thu Thao Havan
	)	
Filed: September 29, 2000	)	
	)	
For: SYSTEMS AND METHODS FOR IMPROVING CONCEPT LANDSCAPE VISUALIZATIONS AS A DATA ANALYSIS TOOL	)	

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Sir:

TRANSMITTAL LETTER

Enclosed is the following:

1) Petition for three-month extension of time

2) Reply to office action of March 26, 2003

Please grant any extensions of time required to enter this response and charge any required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

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